

# THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office

June 22, 2004

THIS IS TO CERTIFY THAT ANNEXED HERETO IS A TRUE COPY FROM  
THE RECORDS OF THE UNITED STATES PATENT AND TRADEMARK  
OFFICE OF THOSE PAPERS OF THE BELOW IDENTIFIED PATENT  
APPLICATION THAT MET THE REQUIREMENTS TO BE GRANTED A  
FILING DATE.

APPLICATION NUMBER: 60/501,934

FILING DATE: September 11, 2003

RELATED PCT APPLICATION NUMBER: PCT/US04/13880

REC'D 28 JUN 2004

WIPO

PCT

By Authority of the  
COMMISSIONER OF PATENTS AND TRADEMARKS



M. SIAS  
Certifying Officer

**PRIORITY  
DOCUMENT**  
SUBMITTED OR TRANSMITTED IN  
COMPLIANCE WITH RULE 17.1(a) OR (b)

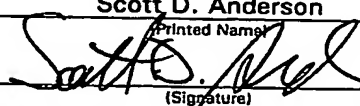
BEST AVAILABLE COPY

13142 U.S. PTO  
/11/03

Atty. Dkt. No. 026032-4597

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Thompson et al.  
Title: RAIL LATCH  
Appl. No.: New Application  
Filing Date: Not Yet Known  
Examiner: Not Yet Known  
Art Unit: Not Yet Known

|   |                              |
|---|------------------------------|
| <b>CERTIFICATE OF EXPRESS MAILING</b><br>I hereby certify that this correspondence is being deposited with the United States Postal Service's "Express Mail Post Office To Addressee" service under 37 C.F.R. § 1.10 on the date indicated below and is addressed to: Commissioner for Patents, PO Box 1450, Alexandria, Virginia 22313-1450. |                              |
| EV 227047656 US<br>(Express Mail Label Number)  | 9/11/03<br>(Date of Deposit) |
| Scott D. Anderson<br>(Printed Name)   |                              |
| <br>(Signature)   |                              |

22389 U.S. PTO  
60/501934

**PROVISIONAL PATENT APPLICATION**  
**TRANSMITTAL**

Mail Stop PROVISIONAL PATENT APPLICATION  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

Transmitted herewith for filing under 37 C.F.R. § 1.53(c) is the provisional patent application of:

Joseph M. Thompson  
3390 Creek Court  
Holland, MI 49424

Mark P. Kadzban  
Grand Rapids, MI

Andrew K. Ruiter  
13137 Acacia Drive  
Grand Haven, MI 49417

Enclosed are:

- [ X ] Specification and Abstract (7 pages).
- [ X ] Drawings (3 sheets, Figures 1-2).

001.1489565.1

The filing fee is calculated below:

|   | Rate     | Fee Totals |
|---|----------|------------|
| Basic Fee   | \$160.00 | \$160.00   |
| <input type="checkbox"/> Small Entity Fees Apply (subtract 2 of above): | =        | \$0.00     |
| TOTAL FILING FEE:   | =        | \$160.00   |

- ☒ A check in the amount of \$160.00 to cover the filing fee is enclosed.
- ☒ The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 06-1447. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 06-1447.

Please direct all correspondence to the undersigned attorney or agent at the address indicated below.

Date 9/11/03

FOLEY & LARDNER  
**Customer Number: 26371**  
 Telephone: (414) 297-5740  
 Facsimile: (414) 297-4900

Respectfully submitted,

By 

Scott D. Anderson  
 Attorney for Applicant  
 Registration No. 46,521

**U.S. PROVISIONAL PATENT APPLICATION**  
**for**  
**LATCH FOR RAIL SYSTEM**

Provisionally Named Inventors: Joseph M. Thompson  
Mark P. Kadzban  
Andrew K. Ruiter

## **LATCH FOR RAIL SYSTEM**

### **FIELD**

**[0001]** The present invention relates to a latch for a rail system such as an overhead or floor rail system mounted in a vehicle. The present invention further relates to a latch that requires fewer actions to operate by the user than the conventional rail system latches.

### **BACKGROUND**

**[0002]** It is generally known to provide for a rail system in an overhead or floor arrangement. Such rail systems typically include modular components (such as storage bins or the like) that may be removed by operating a latch. However, such known latch designs require multiple actions (e.g., pushing, pulling, and/or cinching actions) by the user to operate.

**[0003]** Accordingly, it would be advantageous to provide an improved latch for an overhead or floor rail system. It would also be advantageous to provide a latch for a rail system that simplifies the attachment of modules to the rail system. It would also be advantageous to provide a latch for a rail system that reduces the actions required by the user to operate it. It would also be advantageous to provide a latch for a rail system that only requires one action by the user (e.g., to attach and/or detach the module to the rail system). It would be desirable to provide for a latch for a rail system having one or more of these or other advantageous features. To provide an inexpensive, reliable, and widely adaptable latch for an overhead or floor rail system

that avoids the above-referenced and other problems would represent a significant advance in the art.

### **SUMMARY**

**[0004]** The present invention relates to a latch for a rail system that requires a single operation to attach or detach a module to a rail.

**[0005]** The present invention also relates to a latch for a rail system comprising a foot member rigidly mounted to a handle and configured to rotate within a wing to engage a groove on a rail. As the module gets placed over the rail, an area of the wing comes into contact with the rail that drives the foot into the proper location within the rail groove. The handle is rotated by the user to secure the foot to the rail so that at the end of the handle rotation, the foot engages the rail to provide a secure attachment.

**[0006]** The present invention further relates to various features and combinations of features shown and described in the disclosed embodiments.

### **DETAILED DESCRIPTION OF PREFERRED AND OTHER EXEMPLARY EMBODIMENTS**

**[0007]** Before explaining a number preferred, exemplary, and alternative embodiments of the invention in detail it is to be understood that the invention is not limited to the details of construction and the arrangement of the components set forth in the following description or illustrated in the drawings. The invention is capable of other embodiments or being practiced or carried out in various ways. It is also to be understood that the phraseology and terminology employed herein is for the purpose of

description and should not be regarded as limiting. Further, several comments can be made about the general applicability and the scope thereof.

**[0008]** First, while the components of the disclosed embodiments will be illustrated as an overhead rail system designed for a vehicle, the features of the disclosed embodiments have a much wider applicability. For example, the latch design is adaptable for other storage units, bins, containers, and other office, home, or educational products which employ a storage space configured to move relative to a base or rail or rails. Further, the size of the various components and the size of the containers can be widely varied. The components that are removably coupled to the rail system may be any of a variety of components such as storage bins, or the like.

**[0009]** Second, the particular materials used for making the latch and its associated components may be selected from those well known in the vehicle art including polymers, elastomeric materials, metals and metal alloys, or the like.

**[0010]** Finally, it is important to note that the term "rail," "latch," "wing" and "foot" are intended to be broad terms and not terms of limitation. These components may be used with any of a variety of products or arrangements and are not intended to be limited to use with overhead or floor rail or vehicle applications.

**[0011]** Proceeding now to descriptions of the preferred and exemplary embodiments, FIGURES show a latch for a rail system (shown as an overhead rail system) according to a preferred embodiment. The latch is intended to simplify the attachment of modules to the rail system by reducing the number actions required by the end user to one action so that the ease of use is enhanced by the improved human factors.

**[0012]** The secure attachment of a module to a rail is accomplished by a foot member (preferably a metal foot, but could be any of a variety of materials) that engages into a groove in the side of the rail. This foot is rigidly mounted to a handle (the end user interface) but it is free to rotate within a wing. According to an exemplary embodiment, the wing is plastic, but may be any of a variety of materials. This wing assembly is attached to the module bin by a hinge pin that runs parallel to the rails. As such, this wing assembly is free to pivot relative to the module bin. A spring is used to hold the wing in the open position when the module is off the rail. As the module gets placed over the rail, an area of the wing assembly comes into contact with the rail which drives the foot into the proper location within the rail groove. The user then rotates the handle to secure the foot to the rail. The foot is slightly longer than the rail groove is tall. As such, at the end of the handle rotation, the foot "bites into" (e.g., engages) the rail to provide a secure attachment. According to an exemplary embodiment, the user rotates the handle 90 degrees to secure the foot in the rail.

**[0013]** Operation of the single motion latch requires turning the lever to attach the bin to the rail once the bin is in position. The foot is located into the rail groove when the bin is loaded on to the rail (FIG. 1). The foot cinches to the rail at the end of the 90 degree rotation of the handle (FIG. 2) because the length of the foot is greater than the height of the groove.

**[0014]** In another application of this concept, a spring is used to hold the wing in the closed position when the module is off the rail. Then, when the module is loaded onto the rail, the foot on the wing assembly would snap over the rail and into the



groove. This would allow the end user to easily slide the module on the rail before they finally secure it by rotating the handle.

**[0015]** It is also important to note that the construction and arrangement of the elements of the latch for a rail system as shown in the preferred and other exemplary embodiments are illustrative only. Although only a few embodiments of the present invention have been described in detail in this disclosure, those skilled in the art who review this disclosure will readily appreciate that many modifications are possible (e.g., variations in sizes, dimensions, structures, shapes and proportions of the various elements, values of parameters, mounting arrangements, materials, colors, orientations, etc.) without materially departing from the novel teachings and advantages of the subject matter disclosed herein. Accordingly, all such modifications are intended to be included within the scope of the present invention. The order or sequence of any process or method steps may be varied or re-sequenced according to alternative embodiments. Other substitutions, modifications, changes and/or omissions may be made in the design, operating conditions and arrangement of the preferred and other exemplary embodiments without departing from the spirit of the present invention as disclosed herein.

### **ABSTRACT OF THE DISCLOSURE**

A latch for mounting a module to a rail system is disclosed. The latch includes a foot member that engages a groove in the side of a rail. This foot is rigidly mounted to a handle but it is free to rotate within a piece of plastic shown as a wing. This assembly is attached to the module bin and is free to pivot relative to the module bin. As the module gets placed over the rail, an area of the wing assembly comes into contact with the rail which drives the foot into the proper location within the rail groove. The handle is rotated to secure the foot to the rail so that at the end of the handle rotation, the foot engages the rail to provide a secure attachment.

The **current latch** requires 3 actions to attach the bin to the rail once the bin is in position:

1. PUSH (locates foot into rail groove)
2. TURN (locates foot behind rail flange)
3. CINCH (firmly attaches bin to rail)

The **single motion latch** only requires turning the lever to attach the bin to the rail once the bin is in position.

- The foot is automatically located into the rail groove when the bin is loaded on to the rail (FIGURE 1).
- The foot cinches to the rail at the end of the 90 degree rotation of the handle (FIGURE 2) because the length of the foot is greater than the height of the groove.

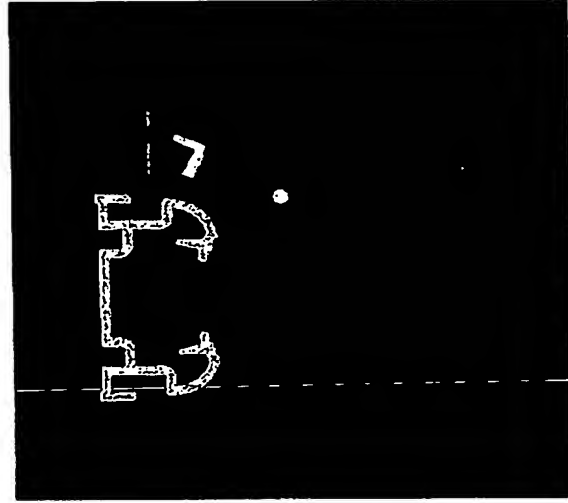
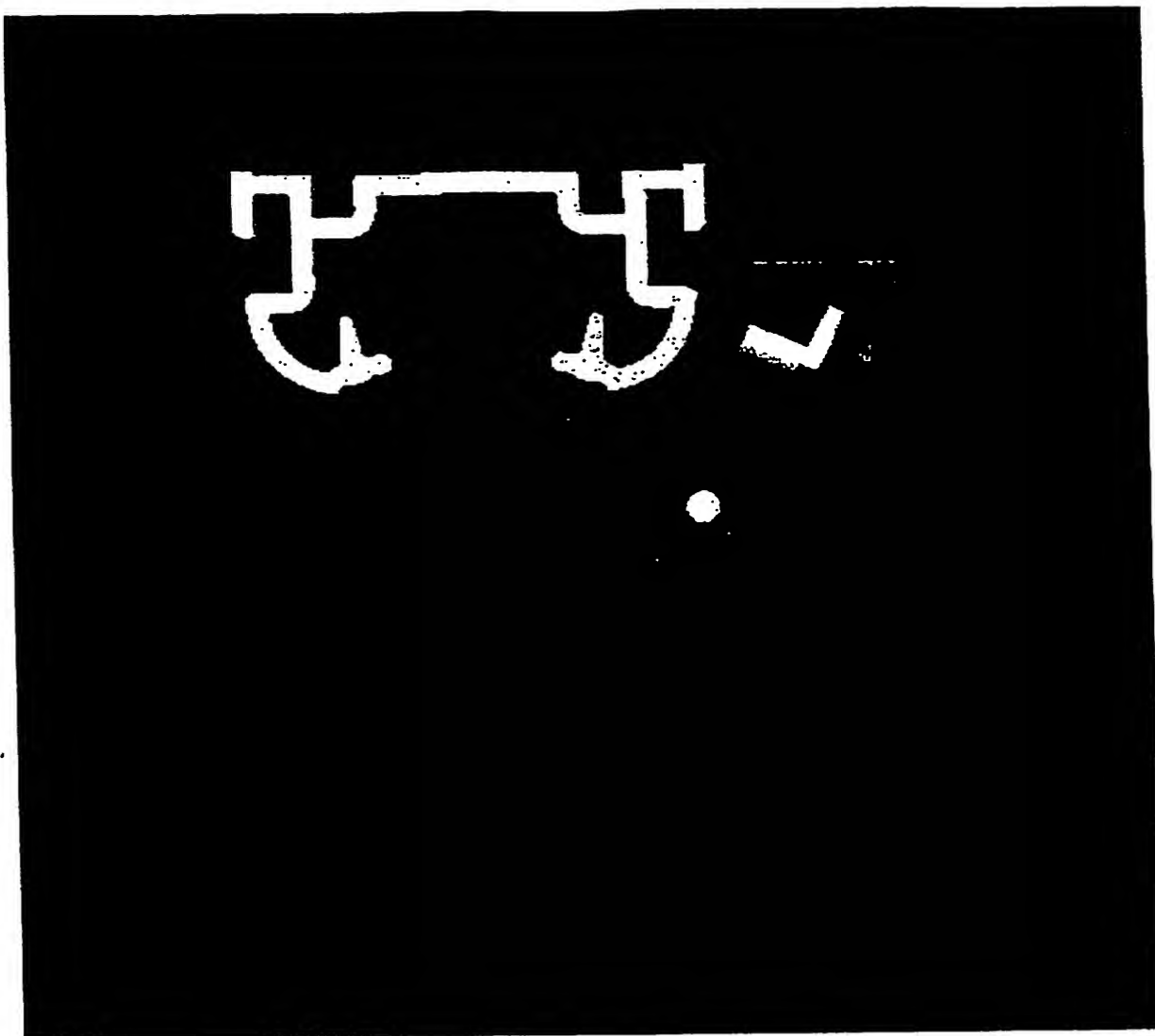


FIGURE 1



FIGURE 2



**FIGURE 1**

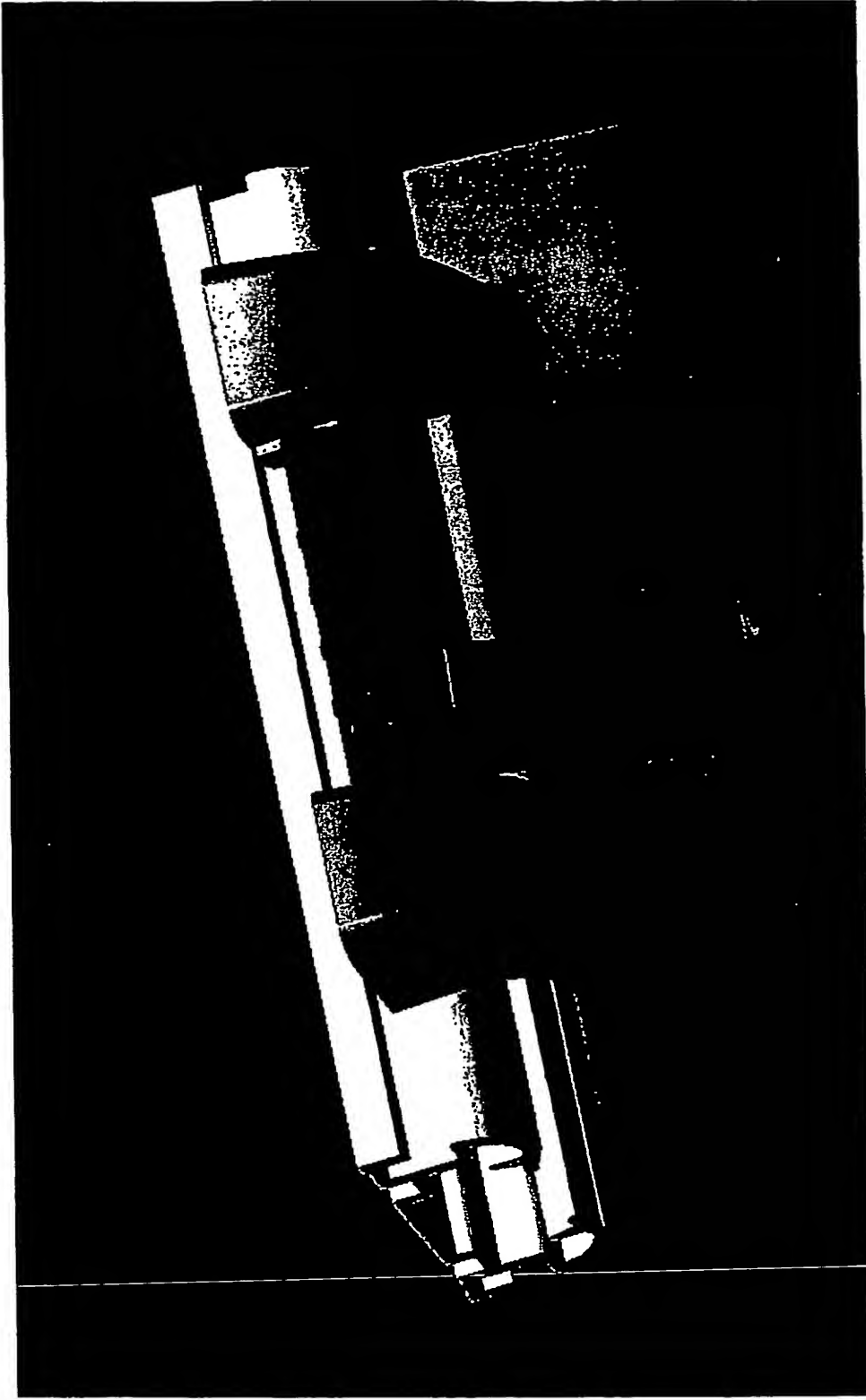


FIGURE 2

This Page is inserted by IFW Indexing and Scanning  
Operations and is not part of the Official Record

## **BEST AVAILABLE IMAGES**

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ BLACK BORDERS
- ☐ IMAGE CUT OFF AT TOP, BOTTOM OR SIDES
- ☒ FADED TEXT OR DRAWING
- ☐ BLURED OR ILLEGIBLE TEXT OR DRAWING
- ☐ SKEWED/SLANTED IMAGES
- ☐ COLORED OR BLACK AND WHITE PHOTOGRAPHS
- ☐ GRAY SCALE DOCUMENTS
- ☒ LINES OR MARKS ON ORIGINAL DOCUMENT
- ☒ REPERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY
- ☐ OTHER: \_\_\_\_\_

**IMAGES ARE BEST AVAILABLE COPY.**

**As rescanning documents *will not* correct images  
problems checked, please do not report the  
problems to the IFW Image Problem Mailbox**